

## REMARKS

Claims 1, 3-20, 23-27 and 29-35 are currently pending in the application. Herein the applicant amends independent claims 1 and 23.

### ***A. RESPONSE TO REJECTION UNDER 35 U.S.C. §112***

In the Office Action the Examiner rejects claims 1, 3-20, 23-27 and 29-35 under 35 USC §112 as being indefinite. The applicant has amended independent claims 1 and 23 to provide remove the offending language.

### ***B. RESPONSE TO REJECTION UNDER 35 U.S.C. §103(a)***

In the Office action the Examiner rejects claims 1, 4-12, 34 and 35 under 35 USC 103(a) as being unpatentable over a lost count and US patent 4,528,252 ("Yamazaki".) In response the applicant has amended the independent claims to more clearly define the structure of the membrane. In particular, the inventor has identified that the selected membrane is highly restrictive to the passage of water, as more fully set out in the attached Declaration of Dr. Thomas Oakes.

Dr. Oakes has made several working models of the hydrogen generator since April 8, 2003. He has used both cation and anion membranes in the various models. (Oakes Declaration para. 5). Since about 2008 Dr. Oakes has on Nafion for the membrane in the models. (Oakes Declaration para. 6). In early 2008, Dr. Oakes built two models of the hydrogen generator, each having a surface area of about ½ square meter. The two models used Nafion as the membrane, and had a water-acid solution as electrolyte. Dr. Oakes tested these units for a few months. (Oakes Declaration para. 7). At the conclusion of testing, the water level on the cathode side was different from the water level on the anode side, due to the electrolysis of the water. After testing, he left the two models with this uneven water level, and set them both aside in his storage facility. (Oakes Declaration para. 8). From early 2008 to July 2011 the two models remained filled with electrolyte and ready for operation, but were not used. (Oakes Declaration

para. 9). In July 2011 (after the last Office Action), Dr. Oakes retrieved the two models of the Hydrogen Generator from storage. The water levels remained uneven for both models, and had not equalized between the cathode side and the anode side. This was surprising as he had expected the water level to equalize as the data sheet for Nafion indicated that it was highly permeable to water. (Oakes Declaration para. 10). Accordingly, in this application, the membrane acted to substantially restrict passage of the water of the electrolyte solution.

Indeed, even the Examiner acknowledges that the membrane of Yamazaki would be expected to pass water, stating "The membrane of Yamazaki ... was permeable to ions, but otherwise impermeable to the electrolyte solution." Accordingly, Yamazaki does not teach or suggest a membrane as claimed.

#### last Office Action 12/1/11

In the Office action the Examiner rejects claims 3 and 15-19 under 35 USC 103(a) as being unpatentable over a lost count and US patent 4,528,252 ("Yamazaki") further in view of US patent 5,512,787 (Dederick.) In response the applicant has amended the independent claims to more clearly define the structure of the membrane. The claimed membrane has the unusual feature of being substantially restrictive to the passage of water, while at the same time acting as a highly efficient proton passing membrane. Yamazaki fails to teach or suggest any such limitation. Accordingly, the combination cannot render the cited claims obvious.

In the Office action the Examiner rejects claims 13, 14, 23, 26, 27, 29 and 30 under 35 USC 103(a) as being unpatentable over a lost count and US patent 4,528,252 ("Yamazaki") further in view of US patent 3,870,616 (Dempsey.) In response the applicant has amended the independent claims to more clearly define the structure of the membrane. The claimed membrane has the unusual feature of being substantially restrictive to the passage of water, while at the same time acting as a highly efficient proton passing membrane. Yamazaki fails to teach or suggest any such limitation. Accordingly, the combination cannot render the cited claims obvious.

In the Office action the Examiner rejects claim 20 under 35 USC 103(a) as being unpatentable over a lost count and US patent 4,528,252 ("Yamazaki") further in view of US patent 4,052,228 (Russell.) In response the applicant has amended the independent claims to more clearly define the structure of the membrane. The claimed membrane has the unusual feature of being substantially restrictive to the passage of water, while at the same time acting as a highly efficient proton passing membrane. Yamazaki fails to teach or suggest any such limitation. Accordingly, the combination cannot render the cited claims obvious.

In the Office action the Examiner rejects claims 24 and 25 under 35 USC 103(a) as being unpatentable over a lost count and US patent 4,528,252 ("Yamazaki") further in view of US patent 5,512,787 (Dederick.) In response the applicant has amended the independent claims to more clearly define the structure of the membrane. The claimed membrane has the unusual feature of being substantially restrictive to the passage of water, while at the same time acting as a highly efficient proton passing membrane. Yamazaki fails to teach or suggest any such limitation. Accordingly, the combination cannot render the cited claims obvious.

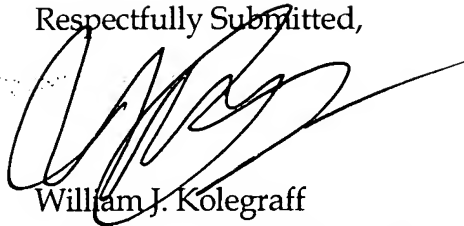
In the Office action the Examiner rejects claims 31 and 32 under 35 USC 103(a) as being unpatentable over a lost count and US patent 4,528,252 ("Yamazaki") further in view of US patent 4,352,722 (Ohkawa.) In response the applicant has amended the independent claims to more clearly define the structure of the membrane. The claimed membrane has the unusual feature of being substantially restrictive to the passage of water, while at the same time acting as a highly efficient proton passing membrane. Yamazaki fails to teach or suggest any such limitation. Accordingly, the combination cannot render the cited claims obvious.

## **B. CONCLUSION**

The applicant respectfully submits that all pending claims are in a condition for allowance. If the Examiner would find it helpful, the Examiner is invited to contact

the undersigned attorney of record.

Respectfully Submitted,

A handwritten signature in black ink, appearing to read 'W. Kolegraff', written over the printed name.

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